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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,890	07/12/2000	Darko Kirovski	MS1-587US	2503

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EXAMINER	
COLIN, CARL G	

ART UNIT	PAPER NUMBER
2136	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/614,890	KIROVSKI ET AL.	
	Examiner	Art Unit	
	Carl Colin	2136	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-9,12-22,24,26-28 and 35-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9,12-22,24,26-28 and 35-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/2007 has been entered.

Response to Arguments

2. In response to communications filed on 10/30/2007, Applicant has added claim 42; the following claims 1, 4-9, 12-22, 24, 26-28, and 35-42 are presented for examination.

2.1 Applicant's arguments, pages 14-21, filed on 10/30/2007, with respect to the rejection of the claims have been fully considered but they are not persuasive. Regarding claim 1 applicant argues that the action goes on to present that the message 102 is "bits of a covert message". Examiner cannot find where the action specifies that the message 102 is hidden or covert. The rejection on the other hand states "a second data pattern of discrete values which are bits of a carrier or raw bit or control parameter depending on the embodiment that meets the recitation of covert message".

With respect to claim 16, applicant argues that Rhoads does not disclose "assigning each of the multiple watermarks to each of possible discrete values for at least a portion of the covert

message". Examiner respectfully disagrees. Rhoads 6,614,914 discloses that the disclosed watermark should be defined as watermark components and the components may be different watermarks (see column 2, lines 39-55) and further discloses a mapping between the watermark and at least a portion of a covert message that meets the claim limitation of assigning see for instance, column 11, lines 4-32)

"In this manner, the embedder computes the value of the watermark samples for a raw bit using the assignment map to find the spatial location of those samples within the block. From this example, a number of points can be made. First, the embedder may perform a similar approach in any other transform domain. Second, for each raw bit, the corresponding watermark sample or samples are some function of the raw bit value and the carrier signal value. The specific mathematical relationship between the watermark sample, on one hand, and the raw bit value and carrier signal, on the other, may vary with the implementation. For example, the message may be convolved with the carrier, multiplied with the carrier, added to the carrier, or applied based on another non-linear function. Third, the carrier signal may remain constant for a particular application, or it may vary from one message to another. For example, a secret key may be used to generate the carrier signal. For each raw bit, the assignment map may define a pattern of watermark samples in the transform domain in which the watermark is defined. An assignment map that maps a raw bit to a sample location or set of locations (i.e. a map to locations in a frequency or spatial domain) is just one special case of an assignment map for a transform domain. Fourth, the assignment map may remain constant, or it may vary from one message to another. In addition, the carrier signal and map may vary depending on the nature of the underlying image. In sum, there many possible design choices within the implementation framework described above."

Upon further consideration, applicant has not overcome the rejection and claims 1, 4-9, 12-22, 24, 26-28, and 35-41 remain rejected.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 8/27/2007 and 10/30/2007 is being considered by the examiner.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-9, 12-15, 18-22, 24, 26-28, and 35-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,614,914 to **Rhoads et al** in view of US Patent 6,449,378 to **Yoshida et al**.

As per claims 1, 7, 35-36, and **40-41, Rhoads et al** discloses a method for concealing data within a digital signal, the method comprising: **Rhoads et al** discloses receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a carrier or raw bit or control parameter depending on the embodiment that meets the recitation of covert message (see column 6, line 50 through column 7, line 40 and

column 9, line 35 through column 10, line 27); imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern (watermarked signal) and encoding a third data pattern into the digital signal (column 7, line 17 through column 8, line 30; column 9, line 60 through column 10, line 18 and column 11, lines 7-32). See also column 3, lines 4-20 and figures 1 and 2. **Rhoads et al** suggests using any non-linear function and further discloses using a spread spectrum modulation wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and discrete value of the second data pattern and multiple discrete values of the first data pattern (see column 16, line 45 through column 17, line 10); **Rhoads et al** suggests that the host signal may be, audio or video as well and may be divided into different time frames and further discloses preprocessing frames of image signal into set of image blocks that meets the recitation of processing the digital signal into a series of bitframes, wherein each bitframe includes a set of frames and wherein each frame includes a set of blocks (column 2, lines 3-61 and column 20, lines 1-67). **Rhoads et al** also suggests replicating a watermark in each block (column 9, line 60 through column 10, line 18) and using one watermark per frame (column 20, lines 1-67) that meets the recitation of wherein a different bit of the watermark is encoded in each frame of a set of frames and the different bit is repeated in each block; each raw bit (covert message) may be spread into a number of chips or defining a pattern of watermark samples which implies that since a watermark can occupy a number of frames, the same raw bit can be replicated in a number of frames that meets the recitation of a same bit of the covert message is encoded in each frame of a set of frames (column 9, line 60 through column 11). See also another embodiment disclosed by Rhoads (column 27, lines 44-67) and Digimarc's Watermarking Technology

(column 37, line 35 through column 38). **Yoshida et al** in a an analogous art discloses a method and apparatus of embedding watermark information in a moving image constituted by a plurality of frames wherein one bit of the watermark information may be embedded one by one in each frame (column 2, line 65 through column 3, line 7 and column 9, lines 30-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to encode a different bit of one watermark information in each frame and a same bit of another watermark information in each frame of a set of frames as suggested by Rhoads and Yoshida. One skilled in the art would have been lead to make such a modification because it would prevent using too many bits to encode the image making detection of the watermark signal less cumbersome as suggested by **Yoshida et al** (see column 3, lines 25-56 and column 10, lines 51-65).

Claims 8, 18, 20, and **22,** recite the same limitation as the rejected claim 1 except for incorporating the claimed method into a computer readable medium, a system, or an apparatus. **Rhoads et al** implements the invention in apparatus and system (see figures 1 and 2). Therefore, claims 8, 18, 20, 22, and 23 are rejected on the same rationale as the rejection of claim 1.

As per claims 9, 13, 19, and **21, Rhoads et al** discloses a method and apparatus for revealing a covert data pattern of discrete values from an encoded data pattern of discrete values in a digital signal, the method comprising: receiving a digital signal the digital signal having a watermark encoded therein the watermark being an encoded data pattern of discrete values is encoded into the signal in one of multiple discrete states, the encoded data pattern representing

multiple data patterns comprising an original watermark data pattern and a covert data pattern, for example (column 7, lines 27-67); extracting a discrete value of the covert data pattern from one or more values of the encoded data pattern wherein the extracting is carried out by decoding a single discrete value of the covert data pattern from the digital signal based upon a state of a multiple discrete values of the encoded data pattern (see column 8, line 50 through column 9, line 17; column 31, lines 35-51). See also column 6, line 50 through column 7, line 40 and column 9, line 35 through column 10, line 27. Claims 9, 13, 19, and 21 recite similar limitations as found in claim 1 and therefore is rejected on the same rationale as in the rejection of claim 1.

As per claim 24, claim 24 recites same inventive concept as claims 1 and 9 except for replacing the second pattern by a covert channel and the first pattern by the watermarked signal. **Rhoads et al** also discloses an orientation pattern or control bits or carrier or key or detection pattern that meets the recitation of covert data pattern (column 7, line 60 through column 7, line 17). Therefore claim 24 is rejected on the same rationale as the rejection of claims 1 and 9.

As per claims 4, 26, and **37, Rhoads et al** discloses the limitation of wherein the Boolean operation is XOR (see column 16, lines 45-60).

As per claims 5, 27, and **38**, **Rhoads et al** discloses the limitation of wherein a pattern of discrete values may be encoded into the signal in one of multiple discrete states (see column 16, line 45 through column 17, line 10); the imposing comprises encoding multiple values of the first

data pattern into the digital signal into a state that indicates a single discrete value of the second data pattern (see column 17, lines 1-20).

As per claims 6, 12, 28, and **39, Rhoads et al** discloses the limitation of wherein the digital signal is selected from a group of consisting of a digital audio signal, a digital video signal, a digital image signal, and a digital multimedia signal (see column 4, lines 50-63).

As per claim 14, Rhoads et al discloses a method for encoding a watermark with a covert message into a digital audio signal, wherein binary bits of the watermark may be encoded into the signal in multiple states, the method comprising encoding multiple bits of the watermark into the digital audio signal into a state that indicates a single discrete value of the covert message (see column 16, line 45 through column 17, line 20). Claim 14 recites similar limitations as found in claim 1 and therefore is rejected on the same rationale as in the rejection of claim 1.

As per claim 15, Rhoads et al discloses the limitation of wherein the multiple states are positive or negative modifications to magnitudes of one or more subbands in the frequency spectrum of a sample of the signal (column 12, lines 7-25 and column 13, lines 4-18).

5. **Claims 16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,614,914 to **Rhoads et al** in view of US Patent 5,745,604 to **Rhoads**.

As per claims 16 and **17, Rhoads et al** substantially teaches a method for imposing a covert message into a watermark, the method comprising: generating multiple watermarks, for example (see column 7, lines 17-26); and discloses using a carrier signal and an assignment map to encode the raw bits into the watermark signal, for each raw bit the assignment map specifies the corresponding image sample or samples that will be modified to encode that bit (see column 9, line 61 through column 10, line 28); and further discloses using the assignment map to look up the position of the sample in the carrier signal, the image sample value at that position in the carrier controls the value of the corresponding position in the watermark information signal, the carrier sample value indicates whether to invert the corresponding watermark sample value... (column 10, lines 55-67) that meets the recitation of assigning each of the multiple watermarks to each of possible discrete values for at least a portion of the covert message selecting a watermark corresponding to a an actual discrete value of a specific portion of a covert message (see also column 10, line 28 through column 11, line 38 for detailed explanation; and another embodiment in column 7, line 50 through column 8); **Rhoads et al** discloses that some bits may be further encoded compared to other bits that meets the recitation of without encoding any portion of the cover message itself into a digital signal encoding the selected watermark into the digital signal (column 16, lines 35-43; column 17, lines 1-10 and 56-64 and column 19, lines 4-15). **Rhoads** discloses in an analogous art generating multiple watermarks (column 11, lines 50-67 *US Patent 5,745,604*) wherein the size of covert message with N bits long resulting into 2^N multiple watermarks, for example (see column 3, lines 35-45 and column 4, lines 8-37 *US Patent 5,745,604*), which provides an efficient way to identify a watermark and adds additional noise as desired. Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify to provide a N-bit identification word as a unique identification binary value to identify a watermark and adds additional noise as desired wherein the size of all portions of the covert message is N bits long and wherein the number of the multiple watermarks is 2^N as taught by **Rhoads**. One skilled in the art would have been motivated to make such a modification because it would provide an efficient way to identify a watermark and add additional noise as desired as suggested by **Rhoads** (column 15, line 10 trough column 16, line 2).

6. **Claim 42** is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,614,914 to **Rhoads et al** in view of US Patent 6,449,378 to **Yoshida et al** in view of Non Patent Literature "Transform Permuted Watermarking for Copyright Protection of Digital Video" by **Johnson et al** *(Applicant's IDS)*.

As per claim 42, Rhoads et al discloses a method for concealing data within a digital signal, the method comprising: **Rhoads et al** discloses receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a carrier or raw bit or control parameter depending on the embodiment that meets the recitation of covert message not repeated throughout the digital signal (see column 6, line 50 through column 7, line 40 and column 9, line 35 through column 10, line 27); imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern (watermarked signal) and encoding a third data pattern into the digital signal (column 7, line 17 through column 8, line 30; column 9, line 60 through column

10, line 18 and column 11, lines 7-32). See also column 3, lines 4-20 and figures 1 and 2. **Rhoads et al** suggests using any non-linear function and further discloses using a spread spectrum modulation wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and discrete value of the second data pattern and multiple discrete values of the first data pattern (see column 16, line 45 through column 17, line 10); **Rhoads et al** suggests that the host signal may be, audio or video as well and may be divided into different time frames and further discloses preprocessing frames of image signal into set of image blocks that meets the recitation of processing the digital signal into a series of bitframes, wherein each bitframe includes a set of frames and wherein each frame includes a set of blocks (column 2, lines 3-61 and column 20, lines 1-67). **Rhoads et al** also suggests replicating a watermark in each block (column 9, line 60 through column 10, line 18) and using one watermark per frame (column 20, lines 1-67) that meets the recitation of wherein a different bit of the watermark is encoded in each frame of a set of frames and the different bit is repeated in each block; each raw bit (covert message) may be spread into a number of chips or defining a pattern of watermark samples which implies that since a watermark can occupy a number of frames, the same raw bit can be replicated in a number of frames that meets the recitation of a same bit of the covert message is encoded in each frame of a set of frames (column 9, line 60 through column 11). See also another embodiment disclosed by Rhoads (column 27, lines 44-67) and Digimarc's Watermarking Technology (column 37, line 35 through column 38). **Yoshida et al** in an analogous art discloses a method and apparatus of embedding watermark information in a moving image constituted by a plurality of frames wherein one bit of the watermark information may be embedded one by one in each frame (column 2, line 65 through

column 3, line 7 and column 9, lines 30-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to encode a different bit of one watermark information in each frame and a same bit of another watermark information in each frame of a set of frames as suggested by Rhoads and Yoshida. One skilled in the art would have been lead to make such a modification because it would prevent using too many bits to encode the image making detection of the watermark signal less cumbersome as suggested by **Yoshida et al** (see column 3, lines 25-56 and column 10, lines 51-65).

Rhoads et al does not explicitly disclose the first data pattern of discrete values which are bits of watermark cannot be identified and manipulated. **Johnson et al** in an analogous art discloses on page 684, second column that an invisible watermark is preferable for copyright protection as visible watermarks are not suitable and do not offer a high level of security and further discloses that to provide copyright protection for a complete image sequence requires repetition of watermark data bits (see page 686, section 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of **Rhoads et al** to provide a watermark that cannot be identified and manipulated and repeated throughout the data signal because it would provide a high level of security for copyright protection as suggested by **Johnson et al**.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl Colin whose telephone number is 571-272-3862. The examiner can normally be reached on Monday through Thursday, 8:00-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser G. Moazzami can be reached on 571-272-4195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl Colin/

Carl Colin
Patent Examiner, A.U. 2136
January 7, 2008